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ABSTRACT

To determine the relationship of characteristics of the consulting teacher model to measures of school achievement, special education for 1,628 children in 42 Vermont sites was examined through a stepwise multiple regression analysis of 17 variables descriptive of service, teaching, community, and school achievement. Service variables included child age and prior learning. Teaching variables included proportion of in-class instruction, amount of instruction, size of child caseload, and size of teacher caseload. Community variables included income, years of schooling and tax effort of community members. School achievement variables included gains in math, reading, and academic performance as well as proportion of instructional objectives achieved. Results indicated negative relationships of proportion of in-class instruction and size of teacher caseload to school achievement. Positive relationships were revealed for amount of instruction, child age, and consulting teacher self-rating to school achievement. (CL)

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An Analysis of the Relationship Between Critical Components of a Special Education Delivery System, Selected Community Demographic Variables and Student Academic Achievement

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ABSTRACT

This study examined the consulting teacher model, a method of delivering special education services to children and teachers in public schools. The study was conducted in order to determine the relationship of characteristics of the consulting teacher model (the independent variables) to measures of school achievement (the dependent variables).

Special education for 1628 children in 42 Vermont sites was examined through a stepwise multiple regression analysis of 17 variables descriptive of service, teaching, community and school achievement. Service variables included child age and prior learning. Teaching variables included proportion of in-class instruction, amount of instruction, size of child caseload and size of teacher caseload. Teaching variables included self and supervisor ratings of the competency level of the classroom teacher and the consulting teacher. Community variables included income, years of schooling and tax effort of community members. School achievement variables included gains in math, reading and academic performance as well as proportion of instructional objectives achieved.

Results of the analysis indicated negative relationships of proportion of in-class instruction and size of teacher caseload to school achievement. Also indicated were positive relationships of amount of instruction, child age and consulting teacher self-rating to school achievement.

Overview

This study examined a methodology of service delivery which is consistent with federal and state regulations requiring a free and appropriate education for all children in the least restrictive environment. (Federal Register, December, 1976). The methodology examined was the consulting teacher model (McKenzie, 1972; Egner & Lates, 1975; Knight, et. al, 1976). Examined were relationships between four sets of model characteristics and one set of school achievement measures. Model characteristics described the child, the service, the teacher and the community. School achievement measures were gains in reading and math.

The study intended to extend research conducted by Jenkins and Mayhall (1976) and by Miller and Sabatino (1978). These two studies demonstrated a clear relationship between school achievement and both the resource room and consulting teacher models. However, missing in this prior research was the specification and examination of various characteristics of the models. The present study attempted to specify and examine characteristics of the consulting teacher model. The same characteristics may be used to describe the resource room model, as the two models differ only in regard to the extent of training provided to the regular classroom teacher and the extent of service provided in the regular classroom. The consulting teacher model is expected to provide teacher training and regular classroom service to a greater extent than the resource room model.

Definition of Terms

Definitions of the thirteen independent variables and four dependent variables follow.

Prior gain per year refers to the number of years of school attendance (beginning with grade one), divided by the grade equivalent score obtained through a September pre-test. Individual gains were added and divided by the total number of children to obtain the mean prior gain per year. A composite list of tests used to obtain grade equivalent scores is presented in Appendix A.

Child age refers to the years and months of age when the pre-test was administered in September.

Percentage of in-class programs refers to the number of instructional programs provided in a mainstream setting (with normal peers in the regular classroom) divided by the total number of instructional programs provided both in the mainstream setting and in tutorial settings separated from the regular classroom. The quotient was multiplied by 100 to obtain the percentage of in-class programs.

Number of programs per child refers to the mean number of instructional programs provided for each child. The total number of programs (i.e. reading, math, language) provided was divided by the total number of children served to obtain the mean number of programs per child.

Number of children refers to the consulting teacher's child caseload, the number of children for whom special education instruction was provided.

Number of teachers refers to the consulting teachers, teacher caseload, the number of teachers who were assigned children for whom special education instruction was provided.

Consulting teacher rating 1 refers to the consulting teacher's rating of his or her own competency level for the 30 competencies representative of the student outcomes of the University of Vermont program to prepare consulting teachers. Categories were exceptional rating (5), high rating (4), acceptable rating (3), poor rating (2), and no rating (1). A mean rating was obtained for each consulting teacher by dividing the sum of the ratings by 30. The rating scale is presented in Appendix B. 42 consulting teachers rated their own competency level.

Consulting teacher rating 2 refers to the school principal's rating of the consulting teacher's competency level for 30 competencies representative of the student outcomes of the University of Vermont program to prepare consulting teachers. The same competencies, rating categories and calculation procedures used for consulting teacher ratings were also used for principal's ratings. When more than one principal rated the consulting teacher, the mean of the mean scores was calculated and used to represent consulting teacher rating 2. 62 school principals rated the 42 consulting teachers.

2. 62 school principals rated the 42 consulting teachers.

Teacher rating 1 refers to the mainstream teacher's rating of his or her own competency level for the 24 competencies representative of the student outcomes of the University of Vermont program to prepare mainstream teachers. These mainstream competencies are the same as the first 24 of the 30 consulting teacher competencies. The same rating categories and calculation procedures as described for consulting teacher ratings were used. Only teachers who were participating in the University of Vermont program to prepare mainstream teachers were rated. 252 mainstream teachers in 32 districts rated their own competency level.

Teacher rating 2 refers to the consulting teacher's rating of the teacher's competency level for the 24 competencies representative of the student outcomes of the University of Vermont program to prepare mainstream teachers. 278 mainstream teachers in 35 districts were so rated.

Income per year refers to the median income of community members 25 years of age or older according to the 1970 United State census figures. If the site contained more than one community, the medians were added and divided by the number of communities to obtain a mean of the medians.

Years of school refers to the median years in school attendance of community members 25 years of age or older according to the 1970 United States census figures. If the site contained more than one community, the medians were added and divided by the number of communities contained in that site to obtain a mean of the medians.

Tax effort refers to the proportion of community wealth to community expenditures for school support. Community wealth is based on the fair market value of all taxable property and community expenditures for school support is based on local school taxes.

Years of math gain refers to the mean number of years and/or months of math gain from September to June for all children receiving math instruction. Gain was calculated by subtracting the pre-test grade equivalent score from the post-test grade equivalent score. A composite list of the math tests used is presented in Appendix A. Although tests varied across sites, the same tests were used within each site.

Years of reading gain refers to the mean number of years and/or months of reading gain from September to June for all children receiving reading instruction. Gain was calculated by subtracting the pre-test grade equivalent score from the post-test grade equivalent score. A composite list of the reading tests used is presented in Appendix A. Although tests varied across sites, the same tests were used within each site.

Years of academic gain refers to the mean number of years and/or months of academic gain from September to June for all children receiving math, reading or language instruction. Academic gain was calculated for each child

by adding reading and math gains and dividing by two. If the child was receiving only math instruction, the math gain score was used. The same procedure was followed if the child was receiving only reading instruction.

Percentage of objectives achieved refers to the number of children who achieved all the school year objectives specified in the Individualized Educational Program, divided by the total number of children who received instruction and multiplied by 100.

Methodology

The multiple regression analysis was used to determine the statistical relationship of school achievement to child, service, teacher and community characteristics. A step-by-step procedure described by Kerlinger (1973) provided the theoretical base for the analysis while the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner and Bent, 1975) provided the computer technology for the analysis.

Measures of school achievement as well as child and service characteristics were obtained in September 1976 and June 1977 for 1965 handicapped children served by the consulting teachers and classroom teachers in 42 Vermont sites. (See Map). Measures were reported to the local school superintendent and the State Department of Education in June of 1977.

Measures of teacher characteristics were obtained through a survey of 42 consulting teachers, 62 principals and 278 classroom teachers in the Spring of 1978. Personal contact was made with each individual to solicit data with 100% response from consulting teachers and principals and a 91% response from classroom teachers.

Community measures of income and years of schooling were obtained through the Vermont Data Bank and the University of Vermont. Tax effort data was obtained through classroom teachers.

A chronology of testing and data retrieval activities is presented in Table 1. Activities occurred between September, 1976 and March, 1977. Activities included the screening of 21,000 children; pre-testing 1628 children; providing service for 1628 children and 278 classroom teachers; post-testing 1628 children; compiling school data; surveying 42 consulting teachers; surveying 62 school principals; surveying 278 classroom teachers; scoring survey data, and assessing socio-economic data.

In September, 1976 screening of the 21,000 children served by the 42 consulting teachers was accomplished. Screening consisted of reviewing the test records of each child in each school population to identify the children eligible for consulting teacher services. Children were considered eligible if test scores indicated a rate of progress less than half (50%) of the average or standard school achievement rate. Of those children who were determined eligible

for service, the forty children whose scores indicated the greatest deficit were pre-tested and served in each district. A total of 1628 children were so identified.

In September, 1976 pre-testing of 1628 children identified through the screening process described above was accomplished. Pre-tests were standardized norm or criterion-referenced tests selected by the school district, approved by the State Department of Education and administered by the local consulting teacher. A composite listing of the tests is presented in Appendix A.

In September, 1976 child service and teacher training began for the 1628 children and their 278 classroom teachers. Service and training consisted of following the consulting teacher steps described by Egner and Lates (1975) and Knight (1978). These steps constitute a system for consulting teachers and teachers to cooperatively develop and implement individualized educational programs for service targeted children. Child service and teacher training activities were conducted through June, 1977.

In June, 1977, post-testing of the 1628 children was accomplished using the same tests used for the pre-testing.

In July and August of 1977, data related to testing, child service and teacher training was reported to the State Department of Education by the consulting teacher. The reliability of the reported data is verified at the local level by the superintendent and at the state level by the Director of the Division of Special Education.

School data used in this study included prior gain, child age, percentage of in-class service, mean number of programs per child and number of children served.

In January, 1978, the 42 consulting teachers were contacted individually. They were informed of the purpose of the study and asked to participate. All agreed to participate and attended one of four group meetings at the University of Vermont campus. At the group meetings they signed consent forms and rated their own competency level on a scale of one to five for the 30 competencies matching their previous course work at the University of Vermont. The scale was developed by the experimenter. The items consisted of those competencies determined essential by a majority of the 15 member Special Education Area faculty at the University of Vermont. (See Appendix B for Competency Rating Scale.)

In order to determine the equality of the items on the competency rating scale correlation between the ratings of odd number items (1, 3, 5, 7...29) and even numbered items (2, 4, 6, 8...30) was determined. The Pearson Product Moment correlation coefficient between the split halves for self-ratings of consulting teachers was .96. For principals' ratings of consulting teachers the correlation coefficient was .97.

In January and February, the 62 school principals supervising consulting teachers were contacted individually. They were informed of the purpose of the study and asked to participate. All agreed to participate and agreed to meet with the

experimenter. At this meeting the principal rated the competency level of the consulting teachers for whom they provided supervision using the same scale used by the consulting teacher. (See Appendix B for Competency Rating Scale.)

In February and March, the 278 classroom teachers who participated in the University of Vermont program to prepare mainstream teachers during the 1976-1977 school year were contacted individually by the consulting teacher to whom they were assigned. They were informed of the purpose of the study and asked to participate. Of the 278 teachers, 252 or 91% agreed to participate.[1] Teachers signed consent forms and rated their own competency level for the 24 competencies matching the training provided by the consulting teacher. The same competency rating scale was used for both classroom teachers and consulting teachers except the last six items (25 to 30) applied only to consulting teachers. Subsequently consulting teachers rated the classroom teachers on the same 24 competency items.

By the end of March, all competency rating scales were compiled and scored. Each item was given equal weight in scoring. The mean score was obtained for each rating by

[1]Of the 42 sites, 35 sites contained teachers who were participating in the University of Vermont program to prepare mainstream teachers. Teachers in 32 of the 35 sites completed the self-rating scale. Teachers in the remaining three districts did not return the self-rating scales in time to be included in the analysis.

adding the ratings for each item, dividing by the total number of items (30 for consulting teachers and 24 for classroom teachers), and multiplying by 100. No response to an item was recorded as the lowest rating.

In April 1978, socio-economic data pertaining to the 75 communities served by the 42 consulting teachers was obtained. The Vermont Community Data Bank at the University of Vermont supplied the median income level of and median years of school completed for community members over 25 years of age. Calculations were based on the 1970 United States census figures. When a consulting teacher served more than one community, income and schooling was calculated for the combined communities.

A document prepared by the State Commissioner of Education titled "State Aid to Education, 1973" was the source of a measure of the proportion of community wealth to expenditures for school support. This proportion is referred to by the State Department of Education as community tax effort. The higher the tax effort in a given community, the greater the amount of state education aid received per child. To measure community wealth one percent of the fair market value of all taxable property is calculated.

To measure community expenditures for school support, the local school tax is divided by the average daily enrollment of resident pupils for the first 30 days of the school year.

Results

A stepwise multiple regression analysis (Kerlinger and Pedhauser, 1973) was used to study the magnitude of the effects of 13 independent variables on each of four dependent variables. Table 2 lists the full and abbreviated names of variables. Table 3 lists the mean and standard deviation for each variable. The regression program of the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975) was used to determine the regression of combinations of one to 13 independent variables on each dependent variable. The independent variable with the highest zero-order correlation was entered first in the first step of the analysis. Table 4, the intercorrelational matrix for all variables shows zero-order Pearson Product Moment correlation coefficients. One additional variable is entered at each step of the analysis, based on the magnitude of the increment resulting in the multiple correlation. Additional variables are added, one at each step, until the F. level or tolerance level is insufficient for further computation or until all the 13 were used. This procedure allowed for the addition of 12 variables for the analysis of math gain; 13 variables for analysis of reading gain; 10 variables for analysis of academic gain; and 12 variables for analysis of objectives achieved. As the amount of variance attributable to the independent variables diminished with each step, a decision was made to report only the first five steps of the analysis. These steps accounted for the greatest portion of the variance.

Significant Pearson Product Moment correlations between all independent and dependent variables are listed on Table 5. Of these 14 significant correlations, several warrant attention. Income per year is significantly and positively related with years of schooling (r = .70) and with tax effort (r = .45). These positive correlations, although expected, indicate some redundancy among independent variables and suggest the deletion of years of school or income per year. There are significant positive correlations among the dependent variables also. Years of reading gain is significantly and positively correlated with years of academic gain (r = .88) and years of math gain (r = .58). Years of academic gain are significantly and positively correlated with year of math gain (r = .77). These correlations indicate that academic gain may be redundant and could be deleted.

The statistics to be presented at each step of the multiple regression analyses is called for prior to their presentation. The first step yields a simple correlation coefficient, while subsequent steps yield multiple correlation coefficients. The first step yields a squared simple correlation, while subsequent steps yield squared multiple correlation. The squared correlation (R^2) indicates the proportion of variance of the dependent variable is accounted for by the independent variable(s). A Beta weight for each independent variable and the value of the Y-intercept (constant) are also produced. A regression equation is constructed using the Beta weight and intercept. The regression equation is tested for significance through an analysis of variance. The resulting F ratio tests the

hypothesis that the regression of the independent variable(s) on the dependent variable is equal to zero. Therefore, the analysis of variance indicates significance of the correlation, but does not indicate the magnitude of the variance accounted for by the variable(s). In addition to testing for significance at each step of the analysis, an F ratio corresponding to each Beta is produced. This test indicates the relative importance of the separate independent variables within each step of the analysis.

The results of the multiple regression analysis for each of the four dependent variables is presented next.

Math Gain

The analysis of school achievement in math indicated 41% of the variance in math gain was attributable to the combined effects of proportion of in-class instruction (11%), amount of instruction (9%), consulting teacher self-rating (8%), size of the teacher caseload (9%) and community tax effort (4%) with overall significance ($P < .05$). Negative relationships were indicated for proportion of in-class instruction and size of the teacher caseload. Positive relationships were indicated for amount of instruction, consulting teacher self-rating and community tax effort (See Table 6).

Reading Gain

The analysis of school achievement in reading indicated 44% of the variance in reading gain was attributable to the combined effects of child age (21%), amount of instruction (6%), proportion of in-class instruction (5%), consulting teacher self-rating (6%), and size of child

caseload (6%) with overall significance ($P<.05$). Negative relationships were indicated for proportion of in-class instruction and for size of child caseload. Positive relationships were indicated for child age, amount of instruction and consulting teacher self-rating. (See Table 7).

Academic Gain

The analysis for school achievement in overall academic performance indicated 41% of the variance in academic gain was attributable to the combined effects of child age (21%), proportion of in-class instruction (7%), consulting teacher self-ratings (6%), size of teacher caselaod (6%) and amount of instruction (1%) with overall significance ($P<.05$). Negative relationships were indicated for proportion of in-class instruction and size of teacher caseload. Positive relationships were indicated for child age, consulting teacher self-ratings and amount of instruction. (See Table 8).

Objectives Achieved

The analysis for school achievement of instructional objectives indicated 19% of the variance in proportion of instructional objectives achieved was attributable to the combined effects of consulting teacher self-rating, teacher self-rating, supervisor rating of consulting teacher, proportion of in-class instruction and child age. A negative relationship was indicated for supervisor ratings of consulting teachers. All other relationships were positive. (See Table 9).

Conclusions

The regression analysis demonstrates significant ($P<.05$) relationships of four independent variables (% of programs in-class, child age, consulting teacher self-rating and number of teachers) to school achievement. These four variables, in addition to number of teachers, singly account for the greatest proportion of the variance in measures of school achievement (8% - 21%). A summary of these proportions are presented on Table 10.

The intercorrelation analysis demonstrates significant correlations of the number of children to prior gain per year and to community tax effort ($P<.01$); of the years in school to number of teachers and principals rating of consulting teachers ($P<.05$); and of years of academic gain to numbers of teachers ($P<.05$). These significant correlations are presented on Table 5.

The regression analysis and the intercorrelation analysis allow certain conclusions relative to determining the relationship between characteristics of the consulting teacher model and school achievement.

Child Age

Older children make greater reading and academic gains than younger children. This relationship may also be influenced by factors external to school which require more advanced reading and academic skills for older children. Examples are reading the driver's training manual and completing application forms for employment.

Prior Gain Per Year and Number of Children Served

Consulting teachers are able to serve greater numbers of children if the children served are less deficit academically. This would support the advisability of a

flexible child caseload assignment dependent upon the severity of the academic deficits.

Proportion of In-Class Instruction

A smaller proportion of in-class instruction is related to overall school achievement, particularly in math. This relationship would support the advisability of careful daily monitoring of child achievement to determine whether out-of-class or in-class placement is most effective and for which academic areas.

Amount of Instruction

A greater number of instructional programs is related to greater school achievement, particularly in math. This relationship supports the notion that more is better. Because an increased number of programs would probably require more time to complete, greater school achievement might also be related to increased instructional time.

Number of Teachers Served

Greater math, reading and academic gains are related to a smaller teacher caseload for consulting teachers. This relationship supports the advisability of generally smaller teacher caseloads. The mean teacher caseload for Vermont consulting teachers is 20 while Miller and Sabatino (1978) report a mean teacher caseload of only 14.

The relationship of number of teachers served and school achievement is clearly similar to the relationship of proportion of in-class instruction to school achievement. One might conclude that a smaller teacher caseload would allow for more effective in-class instruction. Miller and Sabatino (1978) found no difference in child achievement between in-class and out-of-class instruction.

Ratings of Consulting Teachers and Teachers

High consulting teacher self-ratings are consistently related to all measures of school achievement. This might lead one to believe that a high opinion of one's professional competency is necessary for consulting teachers to facilitate greater gains in children. Or, conversely, one might speculate that a high self-rating of professional competency is a function of the knowledge of having facilitated greater gains in children. A third alternative in considering this relationship is the influence of a selection factor. Certain schools with greater potential for accelerating school achievement may have been predisposed to the selection of consulting teachers with high regard for their professional competency.

It is interesting to note a significant correlation ($P<.05$) between the teacher's self-ratings and consulting teacher's ratings of teachers. This correlation speaks to the reliability of the scale, since both sets of raters were informed, through their training, as to the nature of the competencies to be rated. School principals were not knowledgeable

as to the nature of the competencies to be rated, thus their ratings could not be expected to correlate with ratings by consulting teachers.

Community Income, Year of School and Tax Effort

Family income, years of school and community tax effort are not significantly related to school achievement. Tax effort accounted for a small proportion (4%) of the variance in math gain but for no other measure of school achievement.

Additionally, greater tax effort correlated ($P < .01$) with a greater child caseload. This correlation may reflect a generally greater participation in all school services in communities that have a greater school tax effort.

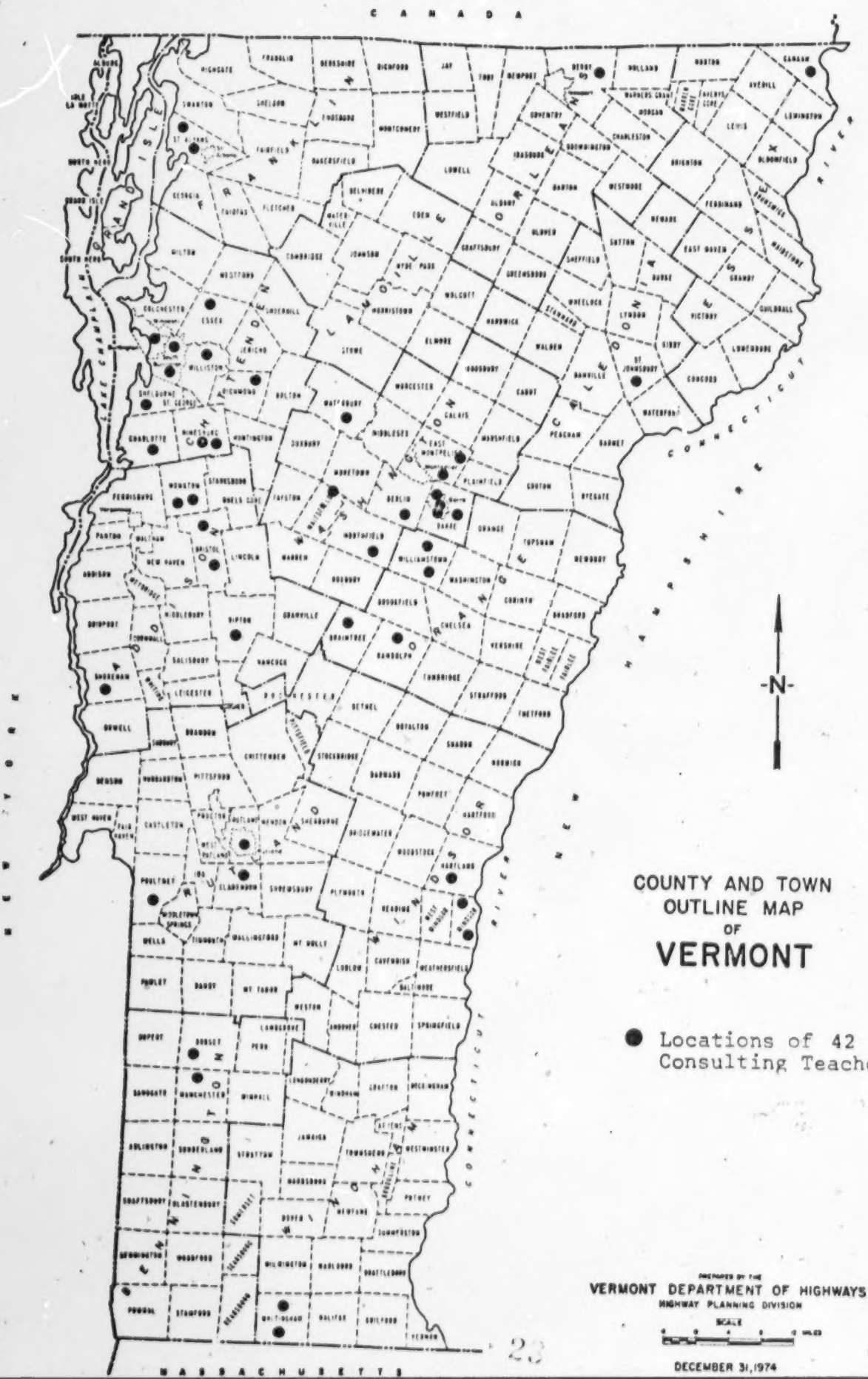
CANADA
-N-
COUNTY AND TOWN
OUTLINE MAP
OF
VERMONT
● Locations of 42
Consulting Teachers
PREPARED BY THE
VERMONT DEPARTMENT OF HIGHWAYS
HIGHWAY PLANNING DIVISION
SCALE
DECEMBER 31, 1974
MASSACHUSETTS

TABLE 1

Chronology of Testing and Data Retrieval Activities

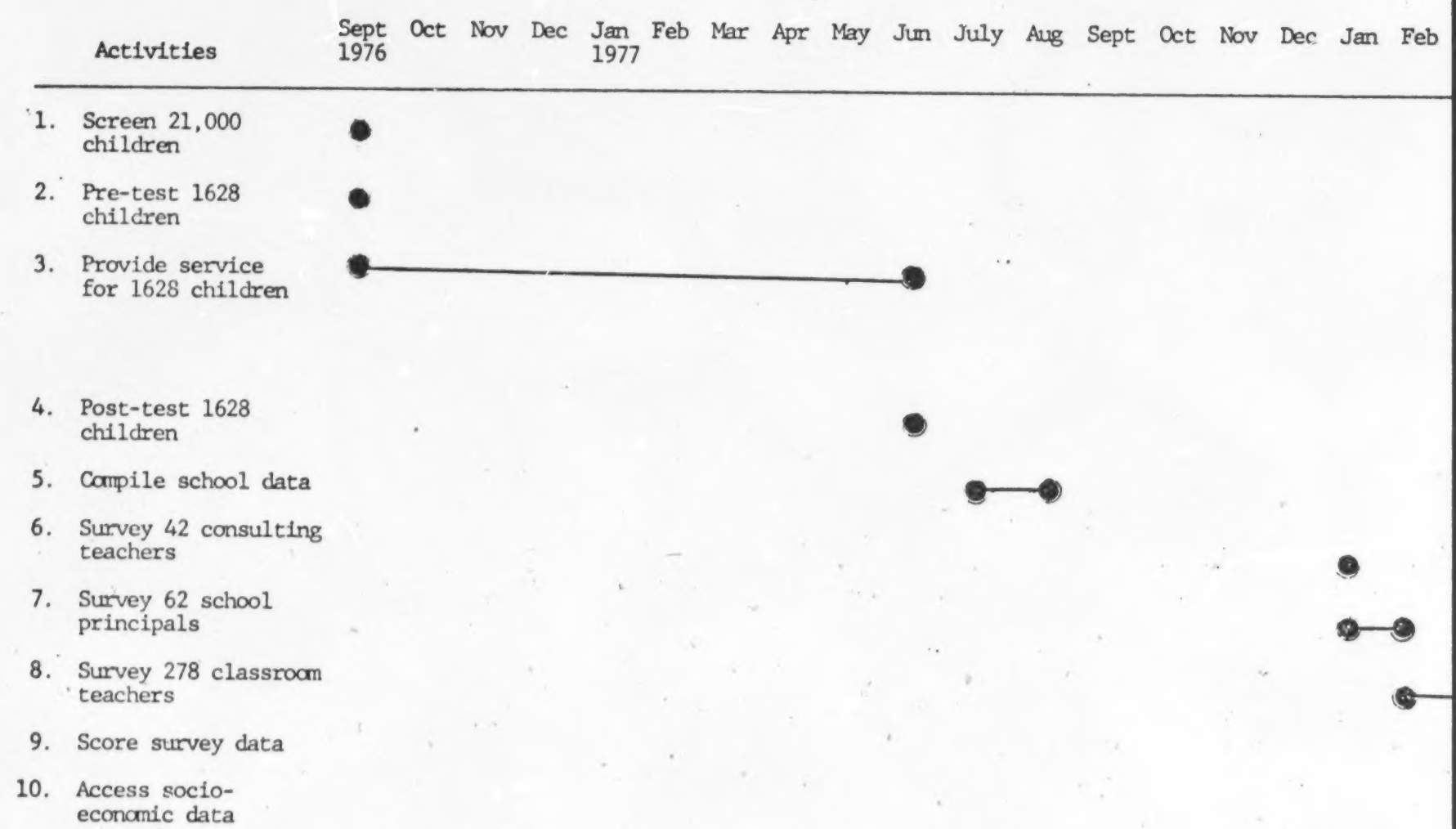

TABLE 2

Full and Abbreviated Names of
Independent and Dependent Variables

	FULL NAME	ABBREVIATED NAME
Independent Variables	1. Mean academic gain in reading and math prior to service	Prior gain/yr
	2. Mean age of children served	Child age
	3. Percentage of instructional programs in regular classroom	% prog in class
	4. Mean number of instructional programs per child	# prog/child
	5. Number of children served	# children
	6. Number of teachers referring children	# teachers
	7. Consulting teacher rating of self	Consult rate 1
	8. Consulting teacher rating by principal	Consult rate 2
	9. Teacher rating of self	Teach rate 1
	10. Teacher rating by consulting teacher	Teach rate 2
	11. Median income of families in community	Income/yr
	12. Median years of education of adults over 25 years of age	Yrs of school
	13. Proportion of community wealth to community expenditures for education	Tax effort
Dependent Variables	1. Mean academic gain in math during service	Yrs math gain
	2. Mean academic gain in reading during service	Yrs read gain
	3. Mean academic gain in math, reading during service	Yrs acad gain
	4. Percentage of children who met objectives during service	% obj ach

TABLE 3

Means and Standard Deviations of
Independent and Dependent Variables

	VARIABLES	MEAN	STANDARD DEVIATION	CASES
Independent Variables	Prior gain/yr	.38 years	.12	42
	Child age	10.25 years	2.34	42
	% prog in class	55.27 percent	29.77	41
	# prog/child	1.28	.31	42
	# children	38.76	20.56	42
	# teachers	19.83	8.20	42
	Consult rate 1	4.17 rating	.52	42
	Consult rate 2	4.24 rating	.68	42
	Teach rate 1	3.74 rating	.38	32
	Teach rate 2	3.53 rating	.60	35
	Income/yr	9414.88 dollars	1761.58	42
	Yrs of school	11.77 years	.84	42
	Tax effort	1.81 proportion	.40	42
Dependent Variables	Yrs math gain	1.90 years	.94	35
	Yrs read gain	1.99 years	1.02	40
	Yrs acad gain	2.07 years	.87	42
	% obj ach	52.43 percentage	23.29	41

TABLE 4

Intercorrelational Matrix for All Variables

	Independent Variables												Dependent Variables			
	Prior Gain/yr	Child Age	% Prog in Class	# Prog/Child	# Children	# Teachers	Consult Rate 1	Consult Rate 2	Teach Rate 1	Teach Rate 2	Income/yr	Yrs of School	Tax Effort	Yrs Math Gain	Yrs Read Gain	Yrs Acad Gain	% Obj Ach
Prior gain/yr																	
Child age	-.17																
% Prog in class	-.10	.01															
# Prog/child	.17	.17	.13														
# Children	.50	-.10	-.04	.05													
# Teachers	-.02	-.27	.15	-.08	.38												
Consult rate 1	-.13	-.08	.16	.06	-.00	.27											
Consult rate 2	-.26	.12	.06	.14	-.04	.05	.12										
Teach rate 1	.07	.11	.10	.12	.11	.19	.09	.19									
Teach rate 2	.23	-.26	-.14	.22	.17	-.10	.34	.14	.35								
Income/yr	.04	.23	-.09	-.09	.23	.11	-.16	.18	.31	-.14							
Yrs of School	-.01	.01	.13	-.02	.22	.35	-.11	.35	.20	-.29	.70						
Tax Effort	.25	.21	.28	-.21	.41	.29	-.18	-.13	.11	-.12	.45	.40					
Yrs Math Gain	.10	.18	-.33	.27	.00	-.29	.24	.01	.08	.21	.05	-.15	-.16				
Yrs Read Gain	-.07	.46	-.20	.31	-.25	-.31	.19	.17	.05	.09	.16	-.13	-.14	.58			
Yrs Acad Gain	-.03	.46	-.26	.19	-.14	-.33	.15	.15	-.04	.01	.15	-.16	-.10	.77	.88		
% Obj Ach	.10	.06	.22	.01	-.01	.02	.28	-.09	.23	.05	.07	-.09	-.04	.15	.20	.27	

TABLE 5

Significant Correlations

r	DF	P	Variable 1	Variable 2
.50	41	.01	# Children	Prior gain/yr
.35	31	.05	Teach rate 1	Teach rate 2
.46	39	.01	Yrs read gain	Child age
.46	41	.01	Yrs acad gain	Child age
.41	41	.01	Tax effort	# of children
.35	41	.05	Yrs of school	# of teachers
-.33	41	.05	Yrs acad gain	# of teachers
.35	41	.05	Yrs of school	Consult rate 2
.70	41	.01	Yrs of school	Income/yr
.45	41	.01	Tax effort	Income/yr
.40	41	.01	Tax effort	Yrs of school
.58	32	.01	Yrs read gain	Yrs math gain
.77	34	.01	Yrs acad gain	Yrs math gain
.88	39	.01	Yrs acad gain	Yrs read gain

TABLE 6

Summary of First Five Steps
of Stepwise Multiple Regression Analysis of
Years of Math Gain

Step	Variable(s) Entered[a]	beta	df	F[b]	R	R^2	df	F[c]	Intercept
1.	% Prog in class	-.33	1/26	3.11	.33	.11	1/26	3.11	2.47
2.	% Prog in class	-.37	1/25	4.17	.34	.20	2/25	3.21	1.32
	# Prog/child	.32	1/25	3.07					
3.	% Prog in class	-.41	1/24	5.45*	.53	.28	3/24	3.17*	-.70
	# Prog/child	.30	1/24	3.03					
	Consul rate 1	.29	1/24	2.65					
4.	% Prog in class	-.37	1/23	4.86*	.61	.37	4/23	3.42*	-.53
	# Prog/child	.27	1/23	2.59					
	Consul rate 1	.36	1/23	4.43*					
	# Teachers	-.31	1/23	3.27					
5.	% Prog in class	-.44	1/22	6.10*	.64	.41	5/22	3.03*	-1.84
	# Prog/child	.32	1/22	3.38					
	Consul rate 1	.43	1/22	5.61*					
	# Teachers	-.38	1/22	4.38*					
	Tax effort	.21	1/22	1.29					

[a] See Table 2 for full names of independent variables

[b] The F ratio for the Beta weight at each step of the analysis

[c] The F ratio for the overall R at each step

* $P \leq .05$
** $P < .01$

TABLE 7

Summary of First Five Steps
of Stepwise Multiple Regression Analysis of
Years of Reading Gain

Step	Variable(s) Entered[a]	beta	df	F[b]	$\bar{R}$	R^2	df	F[c]	Intercept
1.	Child age	.46	1/28	7.40*	.46	.21	1/28	7.40*	-4.40
2.	Child age	.42	1/27	6.19*	.52	.27	2/27	4.88*	-.87
	# Prog/child	.24	1/27	2.09					
3.	Child age	.41	1/26	6.38*	.57	.32	3/26	4.11*	-.54
	# Prog/child	.27	1/26	2.72					
	% Prog in class	-.24	1/26	2.14					
4.	Child age	.44	1/25	7.51*	.62	.38	4/25	3.90*	-2.60
	# Prog/child	.26	1/25	2.58					
	% Prog in class	-.28	1/25	3.01					
	Consul rate 1	.26	1/25	2.54					
5.	Child age	.41	1/24	6.93*	.66	.44	5/24	3.76*	-2.07
	# Prog/child	.28	1/24	3.11					
	% Prog in class	-.29	1/24	3.42					
	Consul rate 1	.25	1/24	2.63					
	# Children	-.24	1/24	2.37					

[a] See Table 2 for full names of independent variables

[b] The F ratio for the Beta weight at each step of the analysis

[c] The F ratio for the overall R at each step

* $P < .05$
** $P < .01$

TABLE 8

Summary of First Five Steps
of Stepwise Multiple Regression Analysis of
Years of Academic Gain

Step	Variable(s) Entered[a]	beta	df	F[b]	R	R^2	df	F[c]	Intercept
1.	Child age	.46	1/30	8.16**	.46	.21	1/30	8.16**	.30
2.	Child age	.46	1/29	8.78**	.53	.28	2/29	5.76**	.72
	% Prog in class	-.27	1/28	2.85					
3.	Child age	.49	1/28	9.96**	.58	.34	3/28	4.81**	-.98
	% Prog in class	-.30	1/28	3.82					
	Consul rate 1	.24	1/28	2.37					
4.	Child age	.42	1/27	7.37*	.63	.40	4/27	4.45**	-.65
	% Prog in class	-.28	1/27	3.26					
	Consul rate 1	.30	1/27	3.66					
	# Teachers	-.26	1/27	2.56					
5.	Child age	.40	1/26	6.48*	.64	.41	5/26	3.64*	-.95
	% Prog in class	-.29	1/26	3.53					
	Consul rate 1	.29	1/26	3.38					
	# Teachers	-.25	1/26	2.33					
	# Prog/child	.12	1/26	.64					

[a] See Table 2 for full names of independent variables

[b] The F ratio for the Beta weight at each step of the analysis

[c] The F ratio for the overall R at each step

* $P < .05$
** $P < .01$

TABLE 9

Summary of First Five Steps
of Stepwise Multiple Regression Analysis of
Percentage of Objectives Achieved

Step	Variable(s) Entered[a]	beta	df	F[b]	R	R^2	df	F[c]	Intercept
1.	Consul rate 1	.28	1/29	2.46	.28	.08	1/29	2.46	2.95
2.	Consul rate 1	.26	1/28	2.17	.35	.12	2/28	1.91	-44.07
	Teach rate 1	.21	1/28	1.33					
3.	Consul rate 1	.28	1/27	2.41	.38	.15	3/27	1.54	-30.14
	Teach rate 1	.23	1/27	1.67					
	Consul rate 2	-.16	1/27	.82					
4.	Consul rate 1	.25	1/26	1.93	.42	.17	4/26	1.36	-28.81
	Teach rate 1	.22	1/26	1.47					
	Consul rate 2	-.17	1/26	.86					
	% Prog in class	.17	1/26	.86					
5.	Consul rate 1	.27	1/25	2.06	.43	.19	5/25	1.16	-45.28
	Teach rate 1	.24	1/25	1.65					
	Consul rate 2	-.19	1/25	1.03					
	% Prog in class	.16	1/25	.80					
	Child age	.13	1/25	.49					

[a] See Table 2 for full names of independent variables

[b] The F ratio for the Beta weight at each step of the analysis

[c] The F ratio for the overall R at each step

* $P < .05$

** $P < .01$

TABLE 10

Summary of the Variance Attributable
to Independent Variables for Each Dependent Variable

Table 6
Years of Math Gain

	R^2
% Prog in class	.11*
# Prog/Child	.09
Consult rate 1	.08
# Teachers	.09*
Tax effort	.04
	.41

Table 7
Years of Reading Gain

	R^2
Child Age	.21
# Prog/Child	.06
% Prog in class	.05*
Consult rate 1	.06
# Children	.06*
	.44

Table 8
Years of Acad Gain

	R^2
Child age	.21
% Prog in class	.07*
Consult rate 1	.06
# Teachers	.06*
# Prog/Child	.01
	.41

Table 9
Percentage of Obj Achieved

	R^2
Consult rate 1	.08
Teach rate 1	.04
Consult rate 2	.03*
% Prog in class	.02
Child age	.02
	.19

*Variables with negative beta weights

Appendix A

Composite List of Pre-Post Tests (individually administered)

Norm-Referenced

Wide Range Achievement Test
Peabody Individual Achievement Test
Gates MacGinitie Reading Test
Woodcock Reading Mastery Test
Durrell Analysis of Reading Difficulty
Gilmore Oral Reading Test
Stanford Diagnostic Reading Test
Stanford Diagnostic Math Test

Criterion-Referenced

Key Math Test
Stanford Diagnostic Reading Test
Stanford Diagnostic Math Test
Prescriptive Reading Inventory
Morrison McCall Spelling Scale

Competency Areas	Special Education Competencies of Teachers and Consulting Teachers	(High) 5	4	Ratings 3	2	(Low) 1
FOUNDATIONS OF SPECIAL EDUCATION	1. Uses a data-based approach.					
	2. Integrates a data-based approach with other approaches (e.g. developmental, prescriptive-diagnostic)					
	3. Complies with state and federal regulation (e.g. S98, P.L. 94-142).					
CURRICULUM FOR SPECIAL EDUCATION	4. Uses mastery of basic curriculum skills as a criterion reference to determine students' eligibility for special education.					
	5. Uses basic curriculum skills as a guide for developing goals and objectives for individual students.					
	6. Uses mastery of basic curriculum skills as a means of evaluating progress of individual students.					
IDENTIFICATION AND DIAGNOSIS	7. Assesses level of academic performance using criterion-referenced tests.					
	8. Assesses level of non-academic performance using direct, daily observation.					
	9. Determines eligibility for special education based on criterion-referenced tests or direct, daily observation.					
DEVELOPMENT AND IMPLEMENTATION OF INDIVIDUAL EDUCATION PROGRAMS	10. Sets goals and objectives for the Individual Education Programs (IEPS).					
	11. Develops and/or selects teaching/learning strategies for the IEP.					
	12. Implements the IEPS.					
EVALUATION OF INDIVIDUAL EDUCATION PROGRAMS	13. Develops measurement system to assess student progress toward goals and objectives.					
	14. Measures student progress regularly (at least weekly).					
	15. Evaluates and changes student objectives and teaching/learning strategies based on measures of progress.					
CLASSROOM MANAGEMENT	16. Outlines whole class instructional plans by year, month and week.					
	17. Integrates individual student assignments with the whole class plan.					
	18. Maintains school-approved behavior of whole class throughout the day.					
PROFESSIONALISM	19. Engages in inservice training activities regularly.					
	20. Engages in self evaluation activities regularly.					
	21. Conducts self in a professionally acceptable manner.					
REPORTING AND DISSEMINATION	22. Informs all parents and principal of whole class instructional plan.					
	23. Confers with and gains consent of individual parents regarding IEPS.					
	24. Prepares summary reports for principal indicating student progress relative to IEPS.					

Competency Areas	Special Education Competencies of Consulting Teachers	(High) 5	4	Ratings 3	2	(Low) 1
SYSTEMS DEVELOPMENT AND RESEARCH	25. Conducts single-subject design and group design research to aid in development of innovative special education instruction.					
	26. Adapts special education service to existing school and community structures.					
	27. Conducts systems analysis to aid in development of innovative special education delivery systems.					
INSERVICE TRAINING	28. Trains and monitors adult and student tutors who carry out instructional activities under supervision.					
	29. Assists and trains classroom teachers in special education through IEP consultation workshops and/or courses.					
	30. Cooperates with other specialists in IEP development.					

Appendix B

Teacher Rating Scale

5 - exceptional rating

4 - high rating

3 - acceptable rating

2 - poor rating

1 - no rating

References

Egner, A. and Lates, B.J. The Vermont consulting teacher program: Case presentation. In C. Parker (Ed.) Psychological Consultation: Helping Teachers Meet Special Needs. Reston, Virginia: The Council for Exceptional Children, 1975.

Federal Register, Volume 41, No. 252, December 30, 1976.

Jenkins, J.R., Mayhall, W.F. Development and evaluation of a resource teacher program. Exceptional Children, 43, No. 1, September 1976.

Kerlinger, F.N. Foundations of Behavioral Research. Holt, Rinehart and Winston, 1973.

Knight, M.F. Vermont's Consulting Teacher Model for Inservice Training of Educational Personnel. University of Vermont, Burlington, Vermont, May, 1978.

Knight, M.F., Christie, L., Egner, A.N., Paolucci, P. and Lates, B.J. Rate of task completion for evaluating and monitoring a field-based graduate training program. In Fraley, L. and Vargas, E. (Eds.) Behavior Research in Higher Education. Sponsored by the Society for Behavioral Technology and Engineering, 1976.

McKenzie, H.S. Special education and consulting teachers. In F. Clark, D. Evans, and L. Hammerlynk (Eds.) Implementing behavioral programs for schools. Champaign, Illinois: Research Press Company, 1972, 103-105.

Miller, T.L. and Sabatino, D.A. "An evaluation of the teacher consultant model as an approach to mainstreaming." Exceptional Children, October, 1978.

Nie, N., Hull, C., Jenkins, J., Steinbrenner, K. and Bent, D., Statistical Package for the Social Sciences, McGraw-Hill Book Company, 1975.

State Aid to Education, 1973. Vermont Department of Education, Montpelier, Vermont.

Vermont School Data: Statistics and Information, 1976-1977, Montpelier, Vermont, Vermont State Department of Education .